

REMARKS

This paper is in response to the office action dated June 20, 2003. Claims 1-12, 29-32, 34-37, and 39-41 are pending. Applicants request reconsideration in light of the following remarks, and withdrawal of the outstanding rejections of the claims.

In the office action the Examiner rejected claims 1-4, and 7-9 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,064,522 to Shaw et al. (hereinafter "Shaw"). Also, the Examiner rejected claims 40 and 42 as being unpatentable under 35 U.S.C. §103(a) as being made obvious by Shaw. Further, the Examiner rejected claims 5-6, 10-11, 41, and 43 as being made obvious by Shaw in view of U.S. Patent No. 5,393,675 to Compaan (hereinafter, "Compaan"). Finally, the Examiner rejected claims 29-43 as being made obvious by Shaw in view of U.S. Patent No. 5,578,501 to Niwa (hereinafter, "Niwa"). Applicants contend that all the claims are patentable over Shaw, either alone or in combination with Compaan and/or Niwa, and request withdrawal of the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a).

Applicants note that although the Office Action Summary indicates that claim 12 is rejected, the Examiner has provided no reasoning in the Detailed Action as to why claim 12 is rejected.

As stated by Applicants in their previous response, Shaw teaches a heterojunction solar cell, but has no teaching of doping with nitrogen. All the references to N and N+ refer to n-type layers, which are generally recognized as being negative-type layers. Note that in Shaw each time a reference is made to the capital letter "N", it is used in conjunction with the word "layer" or the word "type". This is further indication that the Shaw disclosure is referring to n-type layers and not nitrogen doping. Shaw does not mention doping in conjunction with nitrogen, and the mere presence of nitrogen in the atmosphere

would not be sufficient to cause significant doping of the material with nitrogen. Further, even if Shaw were to be interpreted to include some incidental nitrogen doping due to the presence of nitrogen in the atmosphere, such nitrogen doped layers would be predominantly n-type layers, and not p-type layers, as defined in Applicants' claims.

In the event that the Examiner persists in his interpretation of Shaw, Applicants are providing with this amendment an affidavit by Professor Victor Karpov of the University of Toledo. In the affidavit Professor Karpov states that based on his extensive experience in the physics of semiconductors, the terminology "N-type layers" and "N+ type layers" in Shaw would undoubtedly be interpreted by those knowledgeable in the field of semiconductors to mean negative doped layers and highly negative doped layers, respectively, being of the type that could supply electrons, in contrast with p-type layers which would accept electrons. Professor Karpov further states that it is very highly unlikely that a person skilled in the art of semiconductors would view the disclosure of the Shaw patent to mean that semiconductor layers having nitrogen doping were created.

Professor Karpov further states that since Shaw teaches the use of reactive sputtering in the presence of a nitrogen/oxygen atmosphere, there is a possibility that a minute amount of nitrogen doping of the semiconductor layers could occur. However, it would be generally recognized by those skilled in the art of semiconductors that such nitrogen doping would create predominantly n-type layers, and would not make p-type layers.

In view of the above, Shaw neither anticipates nor makes obvious Applicants' claims. The secondary references, even when coupled with the disclosure of Shaw, fail to make obvious Applicants' claims. Accordingly, Applicants respectfully request withdrawal of all the rejections of the claims.